

REMARKS

Claims 25 and 27-48 are pending. Claims 25 and 27-48 have been rejected under 35 U.S.C. §103. Claims 25, 27, 33, 34, 37, 40, 41, 43, 46, and 48 have been amended. Support for the amendments to claims 25 and 48 is found at least in the Figures of the present application and on page 13, lines 13 and 14, of the corresponding PCT application. Claims 1-24 and 26 have been cancelled in previous correspondence. Claims 31 and 32 are canceled herein. Claims 25, 27-30, and 33-48 remain for consideration upon entry of the present Amendment. No new matter has been added.

Claims 25, 31-34, and 48 have been rejected under 35 U.S.C. §103(a) as allegedly being obvious over U.S. Patent No. 4,172,761 to Raven et al. (hereinafter “Raven”).

Raven discloses a ferrule-type nuclear reactor fuel grid having adjacently-positioned cells for accommodating respective fuel rods. Each ferrule defines two cells formed from a single piece of metal strip. A dividing partition between the two cells may be a part of the single piece of the metal strip, or it may be a separate piece of metal strip. In one embodiment as shown in FIGS. 3-5 of Raven, the twin-celled ferrule is made from a strip metal blank which is substantially uniform in width but has an integral portion at one end which constitutes the partition about three times the uniform width. The blank from which the partition is made includes end tags. The partition is secured in position by passing these end tags through slots in the strip and folding the tags down flat. The partition is also held in place by a re-entrant fold made in the strip metal blank. In another embodiment as shown in FIGS. 6-8 of Raven, the ends of the metal strip overlap and are joined by a tag and slot configuration, and a separate strip forms the partition between the cells and is fixed in position by being brazed into the strip defining the cells.

Raven fails to disclose, teach, or suggest a sleeve manufactured in a sheet-shaped material formed into a substantially cylindrical shape and extending around and limiting a single cell dimensioned for housing a single fuel rod, as recited in amended claim 25 and in amended claim 48. Instead, the sheet-shaped material shown in Raven houses and encloses two fuel rods.

Furthermore, Raven fails to disclose, teach, or suggest two overlapping end portions of the sheet-shaped material. In Raven, one end portion 9 (the upper end portion in Figure 3 of Raven) is joined to a middle portion of the sheet-shaped material, whereas the other end portion

9 (the lower end portion in Figure 3 of Raven) is joined to an intermediate portion between the upper end portion 9 and the middle portion.

In addition, Raven is unclear (and fails to disclose, teach, or suggest) as to how the lower joint in Figure 3 (of Raven) is configured since Figure 3 discloses three parallel pieces of material presumably joined to each other.

Finally, Raven does not disclose a sheet-shaped material having a material thickness of less than 0.20 mm.

It would thus not be possible for a person skilled in the art to arrive at the claimed subject matter when considering Raven. Furthermore, a person skilled in the art would not be motivated to look to Raven since Raven is directed to a different kind of spacer, namely, a circular spacer provided with double sleeves as shown in Figure 1 of Raven.

One advantage of the overlapping ends of the sheet-shaped material is the possibility to manufacture the sleeve in a very easy manner. The sheet-shaped material can be formed in a simple cutting operation from a larger sheet of material. This permits, in a very easy manner, manufacturing of sleeves with different dimensions. In a nuclear plant and also within one single fuel unit there frequently are fuel rods having different diameters. Such cells with varying diameters can much more easily be manufactured when the sleeve has the configuration defined in the independent claims in comparison with the prior art sleeve.

The very thin thickness of material also allows a minimum flow resistance to be achieved and thus a small pressure drop for the coolant flowing through a nuclear reactor.

The above features clearly distinguish the invention as recited in claims 25 and 48 from Raven.

Because Raven fails to disclose, teach, or suggest what Applicants recite in their amended claims 25 and 48, namely, a sleeve manufactured in a sheet-shaped material formed into a substantially cylindrical shape and extending around and limiting a single cell dimensioned for housing a single fuel rod, Raven fails to teach all of the claim recitations of Applicants' invention. Consequently, because not all of the claim recitations are taught by the cited reference, Applicants' amended claims 25 and 48 are necessarily non-obvious, and Applicants respectfully request that the Examiner withdraw the rejections of claims 25 and 48.

Claims 31 and 32 are canceled, as indicated above, thereby rendering the Examiner's rejections of those claims moot. Accordingly, Applicants respectfully request that the Examiner withdraw the rejections of claims 31 and 32.

Because claims 33 and 34 depend from claim 25, and because claim 25 is asserted to be non-obvious for the reasons presented above, claims 33 and 34 are necessarily non-obvious. Applicants, therefore, respectfully submit that claims 33 and 34 are allowable. Accordingly, Applicants respectfully request that the rejections of claims 33 and 34 be withdrawn.

Claim 27 has also been rejected under 35 U.S.C. §103(a) as allegedly being obvious over Raven in view of U.S. Patent No. 5,331,679 to Hirukawa.

Because claim 27 depends from claim 25, and because claim 25 is asserted to be non-obvious for the reasons presented above, claim 27 is necessarily non-obvious. Applicants, therefore, respectfully submit that claim 27 is allowable. Accordingly, Applicants respectfully request that the rejection of claim 27 be withdrawn.

Claims 35-40 have also been rejected under 35 U.S.C. §103(a) as allegedly being obvious over Raven in view of U.S. Patent No. 5,875,223 to Nylund.

Nylund merely shows a conventional sleeve-spacer having sleeves manufactured from a tube, i.e., there are no overlapping end portions. Moreover, Nylund does not mention any thicknesses of material forming the sleeve. As such, it would be difficult to manufacture conventional sleeves as shown in Nylund with the material thicknesses as recited in the instant claims.

Because claims 35-40 depend from claim 25, and because claim 25 is asserted to be non-obvious for the reasons presented above, claims 35-40 are necessarily non-obvious. Applicants, therefore, respectfully submit that claims 35-40 are allowable. Accordingly, Applicants respectfully request that the rejections of claims 35-40 be withdrawn.

Claims 28-30 and 41-47 have also been rejected under 35 U.S.C. §103(a) as allegedly being obvious over Raven in view of U.S. Patent No. 6,608,881 to Oh et al.

Because claims 28-30 and 41-47 depend from claim 25, and because claim 25 is asserted to be non-obvious for the reasons presented above, claims 28-30 and 41-47 are necessarily non-obvious. Applicants, therefore, respectfully submit that claims 28-30 and 41-47 are allowable. Accordingly, Applicants respectfully request that the rejections of claims 28-30 and 41-47 be withdrawn.

Applicants believe that the foregoing amendments and remarks are fully responsive to the Office Action and that the claims herein are allowable. An early action to that effect is earnestly solicited.

If the Examiner believes that a telephone conference with Applicants' attorneys would be advantageous to the disposition of this case, the Examiner is invited to telephone the undersigned.

Applicants believe that no fees are due with the submission of this Amendment. If any charges are incurred with respect to this Amendment, they may be charged to Deposit Account No. 503342 maintained by Applicants' attorneys.

Respectfully submitted,

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